

Powerful software modules

Computerized Products

Computerized systems ensure the accurate, efficient and consistent record keeping essential for quality predictive maintenance programs. Machinery analysis information is conveniently and automatically stored, capturing data that might otherwise be lost.

Advances in computer and monitoring information processing technology have made it possible to add additional dimensions to machinery monitoring systems. Small, powerful computers can now be effectively interfaced to permanent monitoring systems on critical, essential and general-purpose machinery. Enhanced software programs offer versatility, reducing massive amounts of data to a few standard, easy-to-interpret plots. Such computerized packages are now a common tool for engineers, technicians and operators who have become increasingly comfortable using them.

Engineer Assist Software

Most critical machines have permanently-installed vibration monitoring systems such as the 3300 System that continuously monitor the machinery behavior and performance characteristics. In recent years, the trend has been to enhance these systems by connecting a computer to the monitor racks. The computer collects and stores data from the monitor systems for historical trend purposes. Most computer systems also provide some level of machinery diagnostics. Until now, however, even the most sophisticated on-line system still required someone to review the machinery data and draw conclusions from it.

Bently Nevada's new Engineer Assist Software incorporates over 37 years of valuable application and research experience to allow expert system-type diagnosis of particular machinery problems. Its analysis is based on actual machine vibration data received directly from a Transient Data Manager™ System.



As the data is processed through the Engineer Assist program, text screens advise the user of machinery malfunctions that were detected. You can request additional information regarding the defined malfunctions and possible corrective action recommendations.

Through comprehensive computer screens and hard copy engineering reports, the user and/or machinery specialist engineer is assisted in making informed decisions. By including extensive tutorial text to explain how a particular conclusion was reached, this program is also an excellent training tool for new engineers.

Transient Data Manager™2 (TDM2) and Dynamic Data Manager®2 (DDM2)

TDM2 is an advanced, computerized monitoring system for critical machinery applications. It is used with permanently-installed monitoring instrumentation and can store startup and coastdown information as well as provide current values and alarm dynamic data. Data sampled in a delta time mode provides steady state machinery information. However, when these units do shut down, due to either a planned shutdown or an automatic trip,



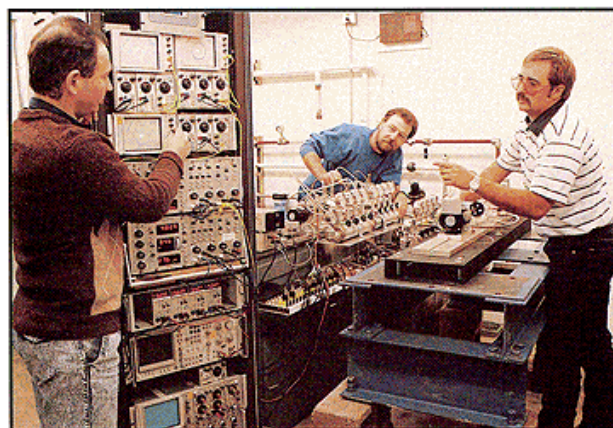
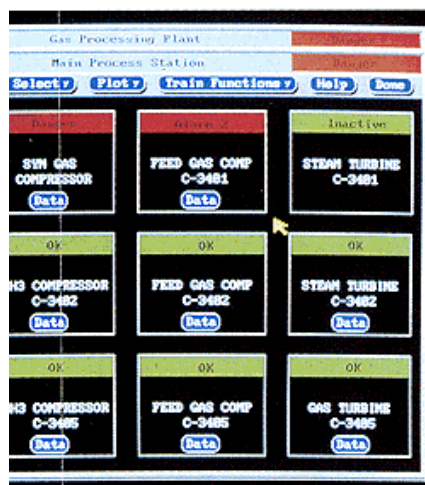
Typical Transient Data Manager™2 computer screens. Using the pull-down menu, you can select data from any of ten systems for display on any station of the network.

TDM2 can automatically switch to delta rpm sampling to record valuable vector and waveform samples during the transient period. Transient data provides vital rotor response characteristic information for determining machinery condition and accurate malfunction diagnosis, further contributing to the overall information needed to make quality engineering decisions. DDM2 functions in a similar manner during machine steady state conditions, but it is not capable of monitoring transient data.

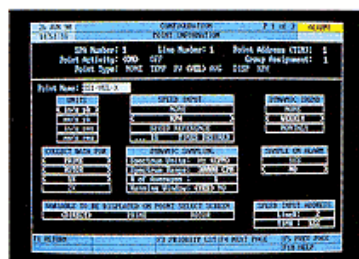
TDM2 and DDM2 Software packages are available offering remote communications for computer connection over long distances (e.g., another city or country).

Networking capabilities for a total system capacity of up to 120 continuous monitor racks, and improved, pull-down menu displays combine to increase the diagnostic value of these powerful systems.

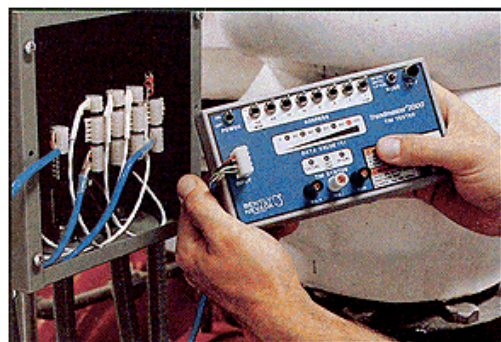
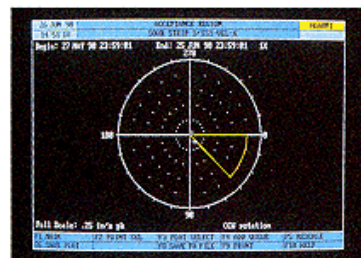
Advanced machinery diagnostics



Bently Rotor Dynamics Research Corporation's theoretical and field experience provides practical solutions to machine problems and advancements in rotor dynamics theory.



Trendmaster® 2000 Remote Access Software provides machinery information from remote or unmanned sites at your location.



The Trendmaster® 2000 System provides all the tools necessary for ease of installation and testing.

Trendmaster® 2000

On-line periodic monitoring is a new development in the field of industrial vibration information systems. Trendmaster® 2000 combines the data availability of a continuous monitoring system with the cost features of a periodic program. The system has the ability to automatically and sequentially sample, process and trend data from a variety of low-cost transducer and process inputs including: acceleration, velocity, displacement, speed, phase reference (Keyphasor®), temperature and/or process signals.

The system is best-applied on machinery located in hard-to-reach,

hazardous or remote areas, or on large numbers of machines in concentrated areas. With this type of a system, accurate and reliable machine condition data can be gathered without exposing personnel to hazardous areas within a plant as might be done through portable, walk-around programs. In addition to safety improvements, maintenance costs are reduced through improved labor efficiency, and maintenance personnel are freed for more meaningful tasks.

Where remote access capabilities are available, maintenance personnel can view and diagnose data remotely via modem or locally by other hardwired

connections. Additional safety, convenience, accessibility and cost-savings can directly result from the timely identification and diagnosis of possible machinery problems that remote capabilities make possible. Among the most common applications for remotely accessing data via telephone line or direct connection are:

- Multiple business units in a refinery or petrochemical plant
- Remote process stations
- Unmanned pipeline pumping stations
- Remote hydroelectric stations

Worldwide service organization



Product Service can assist in the planning, installation and servicing of your Bently Nevada vibration monitoring equipment to ensure proper operation.



Bently Nevada's Machinery Diagnostic Services can meet your requirements for alignment, balancing, shaft crack detection, acceptance testing, predictive maintenance and consultation.

Customer Support Capabilities

Bently Nevada has consistently provided quality products to meet real business problems associated with rotating machinery. We are convinced that quality products demand quality support. Our service organizations are comprised of exceptionally experienced and knowledgeable specialists to provide you with support before and after the sale. Our customer support capabilities include:

- **Bently Rotor Dynamics Research Corporation (BRDRC)**- A modern, well-staffed research group dedicated to the advancement of rotating machinery performance and reliability. Combining laboratory modeling with actual field experience, BRDRC is a leader in the study of rotating machinery behavior. Recognized for studies of machinery malfunctions, the group has developed widely-accepted principles on machinery dynamics.

- **Machinery Diagnostic Services (MDS)** - Experienced engineers located worldwide to quickly identify, document, solve and help prevent your machinery behavior problems. MDS can meet your requirements for alignment, balancing, shaft crack detection, acceptance testing, field commissioning, remote diagnostics, troubleshooting, predictive maintenance and consultation.

- **Design and Installation Services** - Project planning specialists provide full technical service including design, documentation, on-site supervision, installation and full support startup. Working with your project personnel, our Design and Installation Services specialists can design, supervise, coordinate, install and document every phase of your project. Proper and effective project planning and management minimize problems and contribute to on-time project completion.

- **Product Service** - Specialists in installing, calibrating, troubleshooting, repairing and supporting your Bently Nevada equipment around the world. At the heart of our philosophy is the commitment to help you better help yourself. To provide proper operation, Product Service can also assist in the planning, installation and servicing of your Bently Nevada vibration monitoring equipment.

- **Technical Training** - Knowledgeable machinery information specialists available to train and educate all levels of plant personnel. To achieve the greatest benefit from your rotating machinery information systems, your operators and machinery specialists must be knowledgeable in both rotating machinery dynamics and proper equipment operation. Courses are conducted at various locations worldwide. We can also conduct a course tailored to the needs of a specific group or department within your organization. After we have worked with you to identify your training requirements, course presentations are selected and structured to meet those specific needs. ■